

# Multi-Criteria Decision Analysis – Electre I

## Outranking approach in Multi-Objective problems and Strategies outranking relations

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### Overview of the features

Multi-Criteria Decision Analysis (MCDA). The library Electre1.dll contains classes for processing and analyzing Multi-Criteria Decision problems. The library collaborates with MCDA.dll library – the MCDA.dll library contains classes generally applicable for MCDA Tasks. Further support is provided by MCDAJson.dll and JsonFormatting.dll libraries. The Json-formed data enable sharing data in a uniform format with other (MCDA-oriented and others) applications, but also readability similar to xml data.

The Electre1.dll and MCDA.dll libraries support some generalization of Electre I method, e.g. the worst-best pair of values may be specified by the user for ratings by each criterion. The concordance index calculation is supported by several comparison types, and other may be inherited (defined) by the user. The discordance index calculation is supported in a similar way. The resultant outranking graph (relation) may be analyzed in terms of one of the predefined or user-defined Strategy Evaluation class to provide a mean for aggregate Strategy comparison.

A sample Windows application demonstrates the libraries usage. The application reads sample data stored in Json format. The sample data serve as instruction for user data preparation at the same time. The output, results of analyses (calculations), once again Json formatted, will be displayed by the application, and/or can be saved to a file. This makes the sample application able to directly analyze user data/tasks.

The classes in the libraries are documented in xml C# standard way. The Json format and semantics for MCDA tasks is designed to allow data in a single file (or a batch) to be used for Electre I method as well as for other MCDA methods.

The sample application presents information and tips for further software development, either by extending classes or creating end-user applications.

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